



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/898,555	07/02/2001	Terence Joseph Murphy	TI-33069	2709

7590 05/20/2002

Daniel W. Swayze
Texas Instruments, Incorporated
M/S 3999
P. O. Box 655474
Dallas, TX 75265

EXAMINER

GONZALEZ, JULIO C

ART UNIT	PAPER NUMBER
----------	--------------

2834

DATE MAILED: 05/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/898,555

Applicant(s)

MURPHY, TERENCE JOSEPH

Examiner

Julio C. Gonzalez

Art Unit

2834

HL

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 27 February 2002 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 5) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 6) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. In order to avoid abandonment, the drawing informalities noted in Paper No. 5, mailed on 10/19/2001, must now be corrected. Correction can only be effected in the manner set forth in the above noted paper.
2. The proposed drawing correction filed on 2/27/02 has been disapproved because it is not in the form of a pen-and-ink sketch showing changes in red ink or with the changes otherwise highlighted. See MPEP § 608.02(v).
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "42" has been used to designate both driver circuit and driver amplifier. Correction is required.
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: piezo 100. Correction is required.
5. The drawings are objected to because amplifier 42 is not in figure 10 as described in the specifications. Correction is required.
6. The drawings are objected to because in figure 4, the reference 42 is used to point an amplifier 42, which is outside the sensing circuit 42. Correction is required.

7. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the DAC and the ADC disclosed in claims 22 and 23 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Claim Objections

8. Claims 5 and 9 are objected to because of the following informalities: The claims are dependent on a canceled claim. Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 2, 3, 18, 19 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 2, what is meant by "voltage mode"? Is the piezo actuator providing voltage to the sensing circuit? What defines the voltage mode?

In claim 3, how can the piezo actuator charge itself? What is being charged?

In claim 18, in the statement "a capacitor is coupled to the first output", first output of what part of the circuit? What device drives a second output to the piezo actuators? The amplifier 42, the sensing circuit? The current mirror?

In claim 22, is the drive amplifier from the sensing circuit or the drive amplifier outside the sensing circuit (claim 1)?

In order to advance prosecution in the merits, the Prior Art will be applied as best understood by the examiner.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-3 and 5-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson (Patent No 5,588,592) in view of Fontanella et al and Hanks et al.

Wilson discloses a piezo actuator with a drive amplifier 3, a piezo actuator 5, a sensing circuit 15 coupled to the drive amplifier. Moreover, the sensing circuit

comprises a resistor divider and a capacitor is coupled to one of the outputs (see figure 2) and an amplifier 15-6 forms a part of the sensing circuit.

However, Wilson does not disclose a current mirror.

On the other hand, Fontanella discloses for the purpose of enabling precise controlled of large hysteresis loop of voltages in piezoelectric actuators, a current mirror type AB coupled to the output of the drive amplifier (see figure 2).

However neither Wilson nor Fontanella et al disclose using a device that functions in a charge and voltage mode.

On the other hand, Hanks et al discloses for the purpose of detecting if a piezoelectric device is functional thus reducing the number malfunctions in a device that a piezoelectric element can be used with a device that functions in a charge mode (figure 5) and voltage mode (figure 4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design a sensing circuit with an actuator as disclosed by Wilson and to modify the invention by including a current mirror for the purpose of enabling precise controlled of large hysteresis loop of voltages in piezoelectric actuators as disclosed by Fontanella et al and to use a device that functions in different modes for the purpose of detecting if a piezoelectric device is functional thus reducing the number malfunctions in a device as disclosed by Hanks et al.

13. Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson, Fontanella et al and Hanks et al as applied to claims 1 and 13 above, and further in view of Kondou.

The combined piezo actuator discloses all of the elements above. However, the combined piezo actuator does not disclose a control circuit.

On the other hand, Kondou discloses for the purpose of reducing slope measurements thus reducing the burden upon the control processor, a DC control circuit 101 integrated into a compensation loop and a DAC 104 coupled to the drive circuit and an ADC 111 coupled to the sensing circuit.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the combined piezo actuator as disclosed above and to modify the invention by including a control circuit for the purpose of reducing slope measurements thus reducing the burden upon the control processor as disclosed by Kondou.

Response to Arguments

14. Applicant's arguments with respect to claims 1-23 have been considered but are moot in view of the new ground(s) of rejection.

15. Applicant's arguments filed 2/27/02 have been fully considered but they are not persuasive.

The voltage mode and charge mode are not defined as to how such different modes affect the piezo actuator. Such modes are only mention, but does not differentiate between the modes or as to how the modes make an improvement in the circuit nor how the modes will improve the efficiency of the piezo actuator.

16. In response to applicant's arguments, the recitation "drive a disk" in claim 1 has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

17. In response to applicant's argument that the piezo actuator drive circuit is used to drive a disk, a recitation of the intended use of the claimed invention must

result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

18. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, all the references are related to making improvements to piezo actuators or are directly related to a functional performance of piezo actuators.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julio C. Gonzalez whose telephone number is (703) 305-1563. The examiner can normally be reached on M-F (8AM-5PM).

Application/Control Number: 09/898,555
Art Unit: 2834


Page 10

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Jcg

May 14, 2002


NESTOR RAMIREZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800